

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated July 12, 2007. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1-10 stand for consideration in this application. Claims 1-18 are being amended to more particularly point out and distinctly claim the subject invention. New claims 19-20 are being added. All the amendments to the claims and the drawings are supported by the specification. Applicant hereby submits that no new matter is being introduced into the application through the submission of this response.

Formality Rejection

Claim 2 was objected to for informalities, and claim 18 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicant respectfully points out the rejection to claim 18 should have been rejection to claim 8. As the claims are being amended as required by the Examiner, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

Allowable Subject Matter

Claim 9 would be allowed if rewritten into independent form to include all limitations of the base claim and any intervening claims.

Prior Art Rejections

Claims 1-8, 10-12, 14 and 16-18 were rejected under 35 U.S.C. §102(e) as being anticipated by US 2007/0110060 of Miki et al. (hereinafter "Miki"), and claims 13 and 15 were rejected under 35 U.S.C. §103 (a) as being unpatentable over Miki in view of US 2002/0133534 of Forslow (hereinafter "Forslow"). These rejections have been carefully considered, but are most respectfully traversed.

An access router 500 of the present invention (for example, Embodiment 1 depicted in Fig. 2-6), as now recited in claim 1, comprises: a controller which triggers an L2TP Network

Server (LNS) (1821 in Fig. 4, p.3, line 15) function of terminating a plurality of L2TP tunnels or an L2TP Access Concentrator (LAC) (1811 in Fig. 4; p. 3, lines 3-4) function of initiating a plurality of L2TP tunnels for a plurality of virtual routers (e.g., VR1-VR3 in Fig. 3; p. 15, last paragraph) accommodated therein (*"the LAC function is a function to form a L2TP tunnel in a L2TP transfer network, the LNS function is a function to terminate the L2TP tunnel formed by the LAC"* p. 9, lines 13-16) and utilizes a routing information table (e.g., Fig. 8A) to support each one of the virtual routers to perform routing actions *independently* from other virtual routers (p. 10, last paragraph); a plurality of communication I/Fs 511-514 in Fig. 2 to transmit and receive packets to and from external communication lines; a plurality of first logical interfaces associated with the communication I/Fs to transmit and receive packets to and from user terminals; a plurality of second logical interfaces associated with the communication I/Fs to transmit and receive packets to and from backbone networks; and a memory 520/542 stored with the routing information table 545 (Fig. 8A; p. 24, last paragraph) of the plurality of virtual routers which includes a plurality of individual routing tables (VR_0: entries 2122-2123, 21340-2137; VR_1: entries 2124-2127, 2133) each corresponding to one of the virtual routers and associating a respective virtual router (e.g., VR-0) to one of the communication I/Fs (e.g., ATM_11 in entry 2121) as an input I/F, one of the communication I/Fs (e.g., ATM_11 in entry 2137) as an output I/F, one of the first logical interfaces, and one of the second logical interfaces per action (e.g., Decap PPPoE, Map L2TP, etc.). Packets received from the first logical interface are forwarded to one of the second logical interfaces associated with a respective virtual router according to the routing information table corresponding to the respective virtual router associated with the first logical interface.

The invention recited in Claim 8 is directed to an access router similar to the one recited in claim 1 but recites a processor which executes predetermined processing on packets transmitted and received through a user terminal and utilizes an interface table 545 (Fig. 8A) to support each of a plurality of virtual routers accommodated therein to perform routing actions *independently* from other virtual routers; and the memory stores: the interface table holding, for each of interfaces, a relation among a physical interface identifier or a logical interface identifier of the received packet, an identifier representing a protocol supported by the interface, information specifying processing to be executed based upon the protocol, and a virtual router identifier; and a routing information table holding routing information to be processed by virtual routers corresponding to the virtual router identifiers, respectively. The invention recited in Claim 18 is directed to a business method implemented via the access router of claim 8.

Claim 6 recites a table 546 (Fig. 8A; p. 25, 2nd paragraph) includes a virtual router field 2111 for storing virtual router identifiers (e.g., VR_1), a destination IP address field 2112 for storing destination IP addresses (e.g., 192.168.20.1) of received packets, an address mask field 2113 for storing an address mask (e.g., 255.255.255.0), a self-address field 2114 for storing an identifier (e.g., "0") indicating whether a packet to be processed is a self-addressed packet or not, a next hop address field 2115 for storing an address (e.g., 192.168.10.2) of a next hop node, a physical I/F field 2116 for storing physical I/F identifiers (e.g., Ether_12), and a logical I/F field 2117 for storing logical I/F identifiers (e.g., UDOP_1701).

"All function units except for the physical I/F processing unit 520 and SW unit 530 must be able to operate independently for each virtual router. Independent operation for each virtual router may be realized by a plurality of methods. For example, it may involve mounting the same number of independently operating processors as that of the virtual routers; using a common processor but running the same number of independent processes as that of the virtual router; or using a common processor and a common process but employing internal virtual router identifiers. In this configuration the method using the virtual router identifiers will be explained. In this case, mapping to virtual routers can be realized by marking individual packets with virtual router identifiers (p. 10, last paragraph)".

L2TP transfer networks 651-653 are built independently of each other without having to be aware of the presence of one another. Since L2TP transfer networks need only be a simple IP network, a new service of "relaying L2TP tunnels", nonexistent so far and different from the access line providing service or ISP service of the prior art, can be set up. As such, an access line provider can connect to a plurality of relay carriers' networks 651-653 by using a single access router 500 (p. 16, 2nd paragraph). Other advantages of the present invention include (p. 20-21): The access router holds a plurality of routing information, the connection with a plurality of independent IP networks is made easy. The invention assigns the management authority over a LAC device to an access line provider/communication carrier for each virtual router realized in the access router, such that the access line provider may wholesale (transfer or assign the management authority over) any or all of the functions (claim 18). There is no need to ground different LAC routers for different service categories and only one access router of the present invention needs to be grounded. Since individual virtual routers cooperate with different authentication, authorization, and accounting (AAA) servers respectively, the sessions accommodated in the entire device can be distributed to virtual routers.

Applicant respectfully contends that none of the cited prior art references teaches or suggests such “a controller which triggers an L2TP Network Server (LNS) function of terminating a plurality of L2TP tunnels or an L2TP Access Concentrator (LAC) function of initiating a plurality of L2TP tunnels for a plurality of virtual routers accommodated therein and utilizes a routing information table (e.g., Fig. 8A) to support each one of the virtual routers to perform routing actions *independently* from other virtual routers;” or “a memory 520/542 stored with the routing information table 545 (Fig. 8A; p. 24, last paragraph) of the plurality of virtual routers which includes a plurality of individual routing tables (VR_0: entries 2122-2123, 21340-2137; VR_1: entries 2124-2127, 2133) each corresponding to one of the virtual routers and associating a respective virtual router to one of the communication I/Fs as an input I/F, one of the communication I/Fs as an output I/F, one of the first logical interfaces, and one of the second logical interfaces per action (e.g., Decap PPPoE, Map_L2TP, etc.)” as the present invention.

In contrast, Miki (Fig. 3) merely discloses a single virtual router and a routing table (Fig. 3) of the single virtual router, but not “a plurality of virtual routers” or “a routing information table 545 (Fig. 8A; p. 24, last paragraph) of the plurality of virtual routers which includes a plurality of individual routing tables utilized to enable each one of the plurality of virtual routers performing routing actions independently” as the present invention. In addition, Miki (Figs. 3-4) only contains information corresponding to the tunnel identifiers (e.g., TL 11, etc), but not any virtual router identifiers (e.g., VR1) as the present invention.

In another embodiment, Miki’s access node AN15 (Fig. 15) merely operates as a single virtual router for virtually fulfilling the functions of a plurality of switching elements ([0054]),” rather than “a plurality of” virtual routers each performing its own functions independently according to the present invention. In addition, this embodiment of Miki does not provide any table containing a plurality of virtual router identifiers as the table of the preset invention.

Forslow fails to compensate for Miki’s deficiencies.

Applicant contends that the cited references or their combinations fail to teach or suggest each and every feature of the present invention as recited in independent claims 1, 8 and 18. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

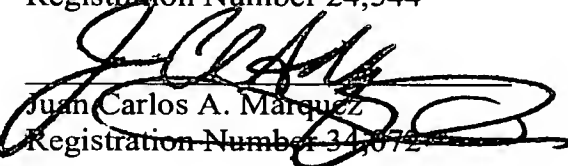
Conclusion

In view of all the above, Applicant respectfully submits that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and telephone number indicated below.

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